

with 7–15, usually 9, punctate and entire leaflets, the terminal one obovate or subrhomboid, or rarely spatulate, 4–12 mm. long, 3–8 mm. wide, the lateral ones oblong, smaller than the terminal ones. Inflorescences glabrous, individual flowers subtended by a linear-oblongate, often leafy bracteole, the pedicels 6–14 mm. long, the flower buds subglobose before anthesis; calyx patelliform, 1 mm. across, shallowly 4-lobed, the lobes round; corolla star-like at anthesis, 2.5 mm. in diameter, glandular, the petals 4, free, suborbicular, nectary annular; stamens 8, attached to the base outside the nectary, the filaments unequal, longer or shorter than the petals, the anthers subglobose, basifixed; ovary sessile or subsessile, the carpels 4, separated at the base, the style club-shaped, laterally attached, the stigma more or less capitate, the ovules 2–4 in each cell. Fruit pseudocapsular, the pericarp dehiscent by an apical slit on the dorsal suture. Mature seeds 2 or 3 in each cell, ovoid, tubercular, and ridged.

CHINA: Yunnan: W. Likiang, La-schi-ba, *R. C. Ching* 21082 (A); 21793 (A); Li-kiang Snow Range, *R. C. Ching* 30276 (A); Kun-ming, Hsi-shan, *K. M. Feng* 104 (A); Haba, Yangtze bank, *K. M. Feng* 1289; Lidjiang, Yü-lung-schan, *Handel-Mazzetti* 3925 (A); Kun-ming, Miao-kao-szu, Ta-p'uchi, *S. K. Lau* 29403 (A); Tong-chouan, *E. E. Maire* in July 1912 (SYNTYPE, photo and fragment, A), in Sept. 1912 (SYNTYPE, fruit, fragment, A); Yunnan-fu, *C. Schneider* 135 (A); Likiang, *C. Schneider* 1764 (A, G), 1780 (A, G), 2822 (A); Kun-ming, Hsi-shan, *O. Schoch* 295 (A); Likiang, *C. W. Wang* 70591 (A), 70705 (A), 71339 (A); Li-chiang Snow Range, *T. T. Yü* 15326 (A). Sikang: Tsa-wa-rung, *C. W. Wang* 65311 (A); without precise locality, *Forrest* 4758 (G). Szechuan: Muli, *J. F. Rock* 18326 (G); Muli, Wa-chin, *T. T. Yü* 14731 (A); Huei-li, *T. T. Yü* 1622 (G).

INDIA: Khazya, *Gardea* 7 (G).

Sauropus changiana sp. nov.

Frutex humilissimus (Plate I, 12), 10–20 cm. altus, ramis rugosis, subteretibus, glanduloso-pubescentibus, 2–3 mm. diametro, striatis, internodiis 1–3 mm. longis; foliis subcoriaceis, olivaceis, utrinque subconcoloribus, glabris, basim prope glanduloso-pubescentibus, obovato-oblongis, 6–7 cm. longis, 2.5–3 cm. latis, apice rotundatis, retusis mucronatisque, basi cuneatis, costa supra et subtus elevata, nervis lateralibus utrinque 7, prominentibus; margine integerrimo, incrassato; petiolo 2–3 mm. longo, glanduloso-pubescente; stipulis cordatis, acuminatis, 5–7 mm. longis, 3 mm. latis, persistentibus; floribus monoeciis, in caulibus trienniis vel vetustioribus fasciculatis, bracteis numerosis, lanceolatis, 1–2 mm. longis (Plate I, 15); pedicellis florum ♂ 3–4 mm. longis, filiformibus, perianthi segmentis 6, crassis, inflexis stamina tegentibus, staminibus 3, filamentis brevissimis, in centro floris connatis (Plate I, 13), antheris peltatis, sessilibus, loculis extrorsum dehiscentibus; pedicellis florum ♀ 2 mm. longis, perianthi segmentis 6, ovatis, 2 mm. diametro, acutis, ovario subgloboso, stylis 3, 2-fidis, ramis incurvatis (Plate I, 14); fructibus non visis.

CHINA: Kwangtung, *F. C. Chang*, in 1950 (TYPE, A).

In October, 1949, a crude drug under the vernacular name of "*lung-li-yeh*" (dragon-tongue-leaf) was sent to me by Dr. F. C. Chang, Head of the Chemistry Department, Lingnan University, Canton, China, for identification. I was told that in Canton the plant was collected and dried for medicinal purposes. A concoction made from the crude drug, in the market known as "*liang-ts'a*" (cold-tea), was sold for the preservation of health, especially in the warm seasons. It is generally believed there that the drink helps to prevent the occurrence of certain summer diseases. Dr. Chang and one of his graduate students, in their study on the antibiotic properties of the Chinese drugs, have extracted an antibiotic principle which has been proved to prohibit the growth of certain disease germs.

Because of the lack of flowers, fruit, or even leaves on the specimen involved, no conclusion even as to the family represented could be reached. The material was sent to Professor I. W. Bailey for anatomical study, with the hope that through the structure of the wood some clue might be found which would help us to work out the identity of the plant. The material, however, proved to be too poor for anatomical study to be of assistance in the problem. Dr. Chang then proceeded, on my suggestion, to search for some fertile material, and a year later he sent me a couple of flowering twigs. With the help of Dr. Lily M. Perry I discovered the genus to be *Sauropus*. This genus had been carefully studied by Dr. Croizat in the Arnold Arboretum some years ago. Here we have for comparison authentic material of all the published species from Asia, although some specimens are no more than fragments. Since my specimen could be identified with none of them, I am describing it as new and naming it in honor of Dr. Chang of Lingnan University.

The obovate-oblong leaf with the rounded obtuse apex, cuneate base, and entire margin, which is thickened by a fine reticulation of veinlets, suggests some relationship with *S. spathulaefolius* Beille. But the Indo-Chinese species has peduncled inflorescences, larger leaves up to 13 cm. long, 5 cm. wide, and internodes at least 1.5 cm. long.

Ilex latifrons Chun in Sunyats. 2: 69. 1934.

Ilex kwangtungensis Merr. var. *pilosissima* Hand.-Mzt., Symb. Sin. 7: 655. 1933.

Ilex latifrons Chun var. *pilosissima* (Hand.-Mzt.) Chun in Sunyats. 2: 70. 1934.

Ilex kwangtungensis sensu S. Y. Hu in Jour. Arnold Arb. 30: 303. 1949, in part.

Since my work on the genus *Ilex* in China was published, I have had an opportunity to examine the specimens of S. P. Ko 51745, an isoparatype of *Ilex latifrons* Chun, and R. C. Ching 8265, an isotype of *Ilex kwangtungensis* var. *pilosissima* Hand.-Mzt. Ko's material was collected from Wun-yi, Kwangtung, and Ching's was from Seh-feng-dar-shan, south of Nanning, Kwangsi. They both have entire coriaceous leaves which are pilose on both surfaces. This character, reinforced by the 5- or 6-pyrened

fruit, makes *Ilex latifrons* Chun a distinct species. It was a mistake to interpret it as *Ilex kwangtungensis* Merr., for this latter species has crenate leaves and 4-pyrened fruit. The large ovate or ovate-oblong or even oblong leaves up to 20 cm. long and 9.5 cm. wide, and the well-developed secondary axis of the infructescences, indicate close relationship with *Ilex maclurei* Merr., but the latter species is entirely glabrous. At first sight the texture of the leaves and the indumentum of the plant remind one of the Formosan species *Ilex lonicerifolia* Hayata. But the insular plant has smaller leaves and simple cymose infructescences.

Ko's Kwangtung specimen was collected from a young and vigorously growing tree 4 m. high. Its leaves are ovate, and their sizes vary between 9×5 and 20×10 cm. Ching's Kwangsi specimens were collected from trees reaching a height of 20–27 m., the leaves of which were ovate-oblong or oblong and varied from 10×3.5 to 18×6 cm. in size. In general the leaves are much narrower than those of the Kwangtung types. Nevertheless the texture, indumentum, and venation of all these specimens are identical. Moreover, the infructescences and fruits of both the Kwangtung and the Kwangsi plants are of like nature. It is very likely that as the plants reach maturity their leaves become narrower. Probably Ching's material represents a more normal form and size of the leaves of the species. Since there is so much variation in the size and shape of leaves in all species of *Ilex*, I see no reason for keeping the Kwangsi plant as a variety of the Kwangtung ones.

When Chun published this binomial he wrote, "This very distinct species must await flowers before it can be assigned to its proper section." However, I think that the solitary cymose infructescences in the axils of the leaves on the current year's growth, and the smooth pyrenes, each with a profound longitudinal dorsal canal, are sufficient to place it in its natural order, namely, the series *Chinenses* of the section *Lioprinus*.

***Ilex subcrenata* sp. nov.**

Sect. *Paltoria*.

Ilex oblata sensu Chun in Sunyats. 4: 225. 1940, non Comber.

Frutex sempervirens, ramulis gracilibus, pubescentibus, hornotinis 0.5 mm. diametro; foliis coriaceis, olivaceis, pubescentibus, subtus punctatis, late ellipticis, 5–12 mm. longis, 4–9 mm. latis, base obtusis vel rotundatis, apice obtusis vel acutis, costa supra obscura, subtus evidens, nervis lateralibus 3 paribus, obscuris; petiolo 2 mm. longo, piloso; stipulis deltoideis, 0.5 mm. longis, acutis, persistentibus; inflorescentiis floris ♂ subfasciculatis, axillaribus, singulis, 1 vel 3-floribus, pedunculis 3–4 mm. longis; pedicellis 1.5–4 mm. longis, pilosis; calycibus patelliformibus, 2 mm. diametro, sparse pubescentibus, lobis 4, deltoideis, erosis ciliatisque; corolla subrotata, 4 mm. diametro, petalis ovatis, 1.5 mm. longis, base leviter connatis; staminibus quam petalis brevioribus; ovario abortivo subgloboso; floribus ♀ et fructibus non visis.

CHINA: Kwangsi: Tseung-yuen, Yao-shan, *C. Wang* 39504 (TYPE, A).

Ilex subcrenata is a shrub occurring in a dense shaded habitat, as re-

corded by Wang. In northern Kwangsi, the white flowers appear in late June. In its punctate leaves and 4-merous flowers it is closely related to *Ilex crenata* Thunb., but the latter species has a much more compact habit, larger and glabrous leaves, and eciliate calyx. In general the staminate inflorescences of *Ilex crenata* are solitary and axillary to leaves of the current year's growth. The fasciculate cases are rare. On account of its punctate leaves I think it should be placed in the series Stigmatophorae. Chun in Sunyatsenia recorded the plant as *Ilex oblata* (Evans) Comber = *Ilex nothofagifolia* Ward. This is an error, for *Ilex nothofagifolia* is a glabrous tree with verruculose branchlets and epunctate leaves.

Ilex yuiana sp. nov.

Sect. Paltoria.

Frutex sempervirens, ramulis gracilibus, subteretis, densis pubescentibus; trienniis 3 mm. diametro, hornotinis 1–1.5 mm. diametro, gemmulis terminalibus debilibus; foliis coriaceis, olivaceis, supra leviter nitidis, minute puberulis, subtus opacis, pubescentibus punctatisque, ellipticis, 1–3 cm. longis, 8–14 mm. latis, base obtusis, vel acutis, apice acutis cuspidatisque, costa supra impressa, subtus elevatis, nervis lateralibus utrinque obscuris; petiolo 3–4 mm. longis, dense pubescentibus; stipulis squamosis, 1 mm. longis, persistentibus; inflorescentiis solitariis, axillaribus, pedicellis fructus 10–12 mm. longis, pubescentibus; fructibus depresso-subglobosis, 5–7 mm. diametro, calycibus persistentibus 3–4 mm. diametro, lobis acutis, pubescentibus ciliatisque, stigmate discoideis; pyrenis 4, 5 mm. longis, 3.5 cm. latis, levibus, endocarpio coriaceo.

CHINA: Yunnan: Taron in Kiu-kiang Valley, *T. T. Yü* 20181 (TYPE, A), 20884 (A).

The distribution of this species seems to be limited to Kiu-kiang Valley of northwestern Yunnan. There, as reported by Yü, it is occasional at an altitude of 1350 m., and common at 2300 m. In having punctate and pubescent leaves it resembles *Ilex triflora* Blume, but the latter species has much larger leaves (3–9 cm. long) and fasciculate fruits. It can easily be distinguished from *Ilex crenata* Thunb. by its thick indumentum and from *Ilex szechwanensis* Loes. by its uniformly small leaves. Its small leaves and pubescent branchlets suggest remote relationship with *Ilex yunnanensis* Franch., but this latter species has epunctate leaves. On account of its punctate leaves this species should fall into the series Stigmatophorae.

Ilex miguensis sp. nov.

Sect. Aquifolium.

Frutex sempervirens, ramulis glabris, cinereis, hornotinis 2–2.5 mm. diametro, gemmulis terminalibus, conicis, glabris; foliis coriaceis, olivaceis, utrinque nitidis, ellipticis, 1.5–3 cm. longis, 7–15 mm. latis, basi acutis, raro obtusis, apice acutis spinulosisque, margine remote serratis, dentibus spinosis, costa supra impressa, subtus elevata, nervis lateralibus 4 vel 5 paribus, supra impressis, subtus prominentibus, reticulis subtus evidentibus; petiolo 3 raro 4 mm. longo, glabro; stipulis minutis, persistentibus; inflorescentiis paucifasciculatis, axillaribus; floribus plerumque paribus,

pedicellis 3 mm. longis, glabris, prophyllis 2, basalibus; fructibus rubris, subglobosis, 4 mm. diametro, calycibus persistentibus quadrangularibus; 2 mm. diametro, eciliatis; stigmatе discoideo, minute; pyrenis 4, 3 mm. longis, 2 mm. latis, ligneis, dorso palmatim striatis et esulcatis.

CHINA: Sikang (Eastern Tibet): Rong-tö, above Migu, Zayul, *F. K. Ward 11019* (TYPE, B; fragment, A).

Ilex miguensis is a rare undergrowth in the upper forest of Rong-tö Valley in southern Sikang. It occurs at an altitude of 3300 to 3600 m. In the small size and elliptic shape of the leaves, the impressed nerves on the upper surfaces of the leaves, and the striate and esulcate pyrenes, this species has some resemblance to *Ilex perryana* S. Y. Hu, but the latter species has only one or two spines on each side of the leaves. Moreover, the fruit has only one pyrene. In the more numerous weak-spinose leaves this species resembles *Ilex ciliospinosa* Loes., but the latter has pubescent branchlets and 2-pyrened fruits. On account of its spinose leaves and palmately striate woody pyrenes it can be rightly placed in the series *Dipyrenae*.

Ilex chuniana sp. nov.

Sect. *Aquifolium*.

Arbor parva, ramulis gracilibus, 1 mm. diametro, striatis, pubescentibus; foliis subcoriaceis, olivaceis vel olivaceo-brunneis, utrinque opacis, epunctatis, glabris, lanceolatis vel raro angusto-ellipticis, 3–3.5 cm. longis, 9–15 mm. latis, basi acutis vel acuminatis, apice obtusis, margine crenato, costa supra impressa, subtus elevata, glabra, nervis lateralibus utrinque 5–6; petiolo 3–5 mm. longo, puberulo, supra canaliculato; stipulis minutis, persistentibus; inflorescentiis paucifasciculatis, axillaribus, unifloribus; pedicellis florum ♂ 2 mm. longis, glabris, prophyllis 2, basalibus; calycibus patelliformibus, 2 mm. diametro, lobis ciliatis; corolla rotata, 4 mm. diametro, petalis ovatis, 1.5 mm. longis; staminibus petalis aequilongis, antheris ovoideis; ovario abortivo subgloboso; fructibus subgloboso-ellipsoideis, 5.5 mm. longis, 4.5 mm. diametro, pedicellis fructuum 2 mm. longis, sparse puberulis, calycibus persistentibus quadrangularibus, 2.5 mm. diametro, ciliatis, stigmatе discoideo, 4-lobo; pyrenis 4, 4.5 mm. longis, 3 mm. latis, striatis et esulcatis, pilosis, lignescentibus.

CHINA: Hainan: Ling-shui, *N. K. Chun & C. L. Tso 44368* (NY); Ting-on, *C. Wang 33904* (TYPE A; US).

The description of the fruits is drawn from *Chun & Tso 44368*.

Ilex chuniana is named after Prof. Y. W. Chun, Director of the Botanical Institute, Sun Yatsen University, Canton, China. It is a small tree occurring in the tropical forests of Hainan at an altitude of ca. 1000 m. According to Wang, its yellow-white flowers appear in late December. The fruits are red and remain on the plant until November of the next year. The lanceolate crenate leaves and fasciculate inflorescences suggest a close relationship with *Ilex peiradena* S. Y. Hu, but the latter has punctate leaves which are twice as long. Moreover the staminate fascicles of *Ilex peiradena* have cymose individual branches, and those of *Ilex*

chuniana have only single-flowered branches. On account of its subcoriaceous leaves, short fruiting pedicels, and palmately striate and sulcate pyrenes, this species should be placed in the series Repandae.

Ilex liana sp. nov.

Sect. Aquifolium.

Arbor (?) sempervirens, ramulis robustis, glabris, rugosis tuberculatisque, trienniis 7 mm. diametro, lenticellis ellipticis, elevatis, hornotinis 5 mm. diametro, striato-sulcatis, gemmulis terminalibus et axillaribus, magnis, ovoideis, perulis puberulis; foliis coriaceis, olivaceis, glabris, utrinque opacis, ovato-oblongis, raro ovatis, 8–9 cm. longis, 4.5–5.5 cm. latis, basi rotundatis, apice acutis, margine crenulatis, costa supra impressa, subtus valide elevata, nervis lateralibus 17–18 paribus, utrinque prominentibus, reticulis densissimis, utrinque distinctis; stipulis obscuris; petiolo subterete, 2 cm. longo, glabro; inflorescentiis pseudo-paniculatis, axillaribus, singulis 1-vel 3-floribus, rhachibus 1 cm. longis, rugosis, bracteis ovatis, puberulis ciliatisque, caducis, pedicellis 5–6 mm. longis, glabris vel sparse puberulis, prophyllis 2, basalibus; floribus non visis; fructibus parvis, globosis, 4 mm. diametro, calycibus persistentibus 3 mm. diametro, ciliatis, stigmatibus discoideo, 4-lobo; pyrenis 4, 2.5 mm. longis, 1.5 mm. latis, pilosis, palmatim striato-sulcatis et rugosis, ligneis.

CHINA: Yunnan: M. K. Li 1099 (TYPE, A).

Ilex liana, though insufficiently known, is a very distinct species. Its stout branchlets, large buds, pseudopaniculate infructescences, small fruits, and 4 pilose pyrenes all indicate close relationship with *Ilex sikkimensis* Kurz, but the average leaves of the latter species are twice as large as those of this Yunnan species. Moreover, the venation of a carbon rubbing of the type of *Ilex sikkimensis* is of an entirely different nature. The numerous lateral nerves and the prominent reticulation of the veinlets of *Ilex liana* suggest the venation of *Ilex venulosa* Hook. f., but this species has a very different type of inflorescence. The glabrous branchlets, the coriaceous leaves, and the pseudopaniculate inflorescences indicate some relationship with *Ilex latifolia* Thunb., and I think its natural position should be in the series Denticulatae. It differs from *Ilex latifolia* by having small fruits and smaller leaves with numerous lateral nerves.

In my work on the genus *Ilex* in China, in the key to the sections of the subgenus Prinos, I wrote for the section Prinoides, "Mature fruit black; the pyrenes rugose . . ." Also in the description of the same section I had "Deciduous trees or shrubs with . . . black mature fruit." Later studies and field observations have proved that these statements are insufficient to cover the fruit color of all the species included in this section, for some of them have red fruits. So in both statements a phrase "or red" should be inserted in referring to the color of the fruit.

Luculia yunnanensis sp. nov.

Luculia gratissima sensu How in Sunyats. 7: 27. 1948, non Sweet.

Frutex usque ad 3.5 m. altus; ramulis teretibus, distincte lenticellatis,

pubescentibus, 3–5 mm. diametro, internodiis 2–3 cm. longis; foliis coriaceis, supra glabris, subtus ad nervis crispato-pubescentibus, oblanceolatis, 9–18 cm. longis, 2–5 cm. latis, acuminatis, acumine 1–2 cm. longo, basi cuneatis, costa supra plana, subtus elevata, nervis lateralibus utrinque ca. 14, supra impressis, subtus vix elevatis, perspicuis, reticulis distinctis; petiolo subterete, 1–1.5 cm. longo, glabrescente; stipulis ovato-lanceolatis, caducis, 1 cm. longis; inflorescentiis paniculato-corymbosis, ramulis terminalibus cymosis, cymulis 2- vel 3-floris, bracteis linearibus, 0.5–1.5 cm. longis, deciduis; pedunculis 2 mm. longis, tomentosus; pedicellis 3–5 mm. longis, tomentosus; receptaculis obconicis, tomentosus, 5 mm. longis, 2 mm. diametro; calycis lobis oblanceolatis, 12–15 mm. longis, 3 mm. latis, pubescentibus, ciliatis, acutis, basi cuneatis; corolla hypocrateriforme, rubescente, tubo cylindrico, 2.5–3 cm. longo, limbo 3–5 cm. diametro, lobis 5, obovatis, 1.3–1.5 cm. longis, 9–12 mm. latis, basim versus in utroque latere cristis descendentes intrasinum confluentibus ornatis; staminibus 5, filamentis 1.5 mm. longis, antheris 5–6 mm. longis; vix exsertis; ovario 2-loculare, ovulis numerosissimis, stylis 2.5 cm. longis, stigmatate carnosus, 2-lobis, 4 mm. longis; fructibus oblongo-obovoideis, 2 cm. longis, 8 mm. diametro, pubescentibus, longitudinaliter 12-striatis; seminibus minutis, 0.5 mm. diametro, rugosis, alatis, ali terminalibus, albis, 1–2 mm. longis.

CHINA: Yunnan: Chih-tse-lo, *H. T. Tsai* 54178 (A), 58561 (A), 58474 (A); Shang-pa-hsien, *H. T. Tsai* 54289 (A), 54397 (A), 54671 (A), 54693 (A), 54851 (A), 56598 (TYPE, A), 58856 (A), 58970 (A), 59020 (A); Chui-kiang, west of Cham-pu-tung, *C. W. Wang* 67469 (A); Kiu-kiang Valley (Taron), *T. T. Yü* 19914 (A), 20381 (A), 20993 (A).

This species is easily distinguished from the other described forms by its tomentose receptacles, its flap-like continuous processes on and between the lobes of the corolla, and its oblanceolate leaves. It occurs in northwestern Yunnan. It has been reported as rare at 1700 m. and common at 2300–2500 m. Its flowers are attractive and fragrant, appearing chiefly in September and October, but occasionally as early as August and as late as November.

Morinda brevipes sp. nov.

Frutex scandens, ramis teretibus, glabris, ramulis ultimis 2 mm. diametro, breviter pubescentibus, internodiis 5–25 mm. longis; foliis glabris, integerrimis, chartaceis, olivaceis, ellipticis vel oblanceolatis, 6–10 cm. longis, 1.8–2.8 cm. latis, acuminatis, basi acutis vel cuneatis; apice acutis vel breviter acuminatis; costa supra et subtus elevata, glaberrima, nervis lateralibus utrinque 5–7, supra evidentibus, subtus prominentibus, subtus distincte reticulatis; petiolo 5–9 mm. longo, minute pubescente; stipulis tubiformibus, 4 mm. longis, truncatis, minute pubescentibus, seta 0 vel 1; inflorescentiis fasciculatis, terminalibus, pedunculis 3–4 mm. longis, hispidis, bracteis ovato-deltaideis, 3 mm. longis; capitulis 4–6 mm. diametro, pilosis, 14 ad 16 floribus, receptaculis coalescentibus, setiferis; calycibus

cupuliformibus, 2 mm. diametro, integerrimis, persistentibus; corolla infundibulari, tubo 2 mm. longo, fauce barbato, limbo 5 mm. diametro, lobis 4, apicibus uncinatis; staminibus 4, leviter exsertis, antheris linearibus; disco annulario; stylo 0, stigmatate discoideo; syncarpiis subglobosis, breviter pubescentibus, 12 mm. diametro.

CHINA: Hainan: Yai-chow, *F. C. How* 70435 (A); Po-ting, *F. C. How* 71754 (TYPE, fruit, A).

This distinct species can easily be distinguished from other known forms by its terminal capitula with very short peduncles which are much shorter than the mature fruit. In Hainan Island this plant grows at an altitude of 420 meters in forest or woods, "twining on shrub" as reported by How. Its yellowish green flowers appear in April. The mature fruit is red.

The description of the flower is drawn from *How* 70435.

Morinda howiana sp. nov.

Frutex scandens, ramulis glaberrimis, 2–2.5 mm. diametro, internodiis 1.5–5 cm. longis; foliis chartaceis, brunneis, ellipticis, 6–12 cm. longis, 2–5 cm. latis, breviter acuminatis, basi obtusis vel rotundis; costa supra plana, glaberrima, subtus elevata, glabra, nervis lateralibus utrinque ca. 9, supra obscuris, subtus elevatis, axillis villosis, subtus perspicue reticulatis; petiolo 6–10 mm. longo, breviter pubescente; stipulis tubiformibus, 5–7 mm. longis, glabris, truncatis, setis 4; inflorescentiis fasciculatis terminalibus, pedunculis 8–14 mm. longis, raro longioribus, minute pubescentibus, bracteis ovatis, basi connatis vel liberis; capitulis 9- ad 12-floribus, 4 mm. diametro, glaberrimis, setiferis; receptaculis coalescentibus; calycibus cupuliformibus, integris, ciliatis; corolla infundibulari, tubo brevi fauce barbato, limbo 4–5 mm. diametro, petalis 5, apicibus uncinatis; staminibus 4, antheris linearibus; disco tumido; stylis 1–2 mm. longis, stigmatate bifidis; syncarpiis subglobosis, 8–14 mm. diametro.

CHINA: Hainan: Fan-yah, *Chun & Tso* 44216 (A); No-dao, *J. L. Gressitt* 976 (A); Po-ting, *F. C. How* 71911 (TYPE, flower, A), 73386 (fruit, TYPE, A); Ngai-hsien, *S. K. Lau* 334 (A); Ch'ang-kiang, *S. K. Lau* 1741 (A); Taam-chou, *W. T. Tsang* 60 (A), 89 (A); Nor-tai, *Herb. Hongkong* 401 (A).

This species can be distinguished by its broad elliptic glabrous leaves with tufts of villose pubescence in the axils of the lateral nerves on the lower surfaces. The presence of bristles on the glabrous capitulum is also very characteristic.

Morinda hupehensis sp. nov.

Frutex scandens, ramulis pubescentibus, internodiis 1–5 cm. longis; foliis chartaceis, olivaceis, utrinque pubescentibus, integerrimis, oblanceolatis vel ellipticis, 7–9 cm. longis, 2–3 cm. latis, acuminatis, basi obtusis, raro acutis, costa supra plana, subtus elevata, nervis lateralibus utrinque 7–9, supra obscuris, subtus prominentibus; petiolo 6–8 mm. longo, molle; stipulis tubiformibus, 4 mm. longis, truncatis, pubescentibus, 4-setis;

fructibus terminalibus, fasciculatis, pedunculis 5–8 mm. longis, pubescentibus, bracteis aciculatis, syncarpiis rubris, depresso-subglobosis, 8–10 mm. diametro, pubescentibus, calycibus persistentibus cupuliformibus, integris.

CHINA: Hupeh: En-shih, *H. C. Chow 1818* (TYPE, A).

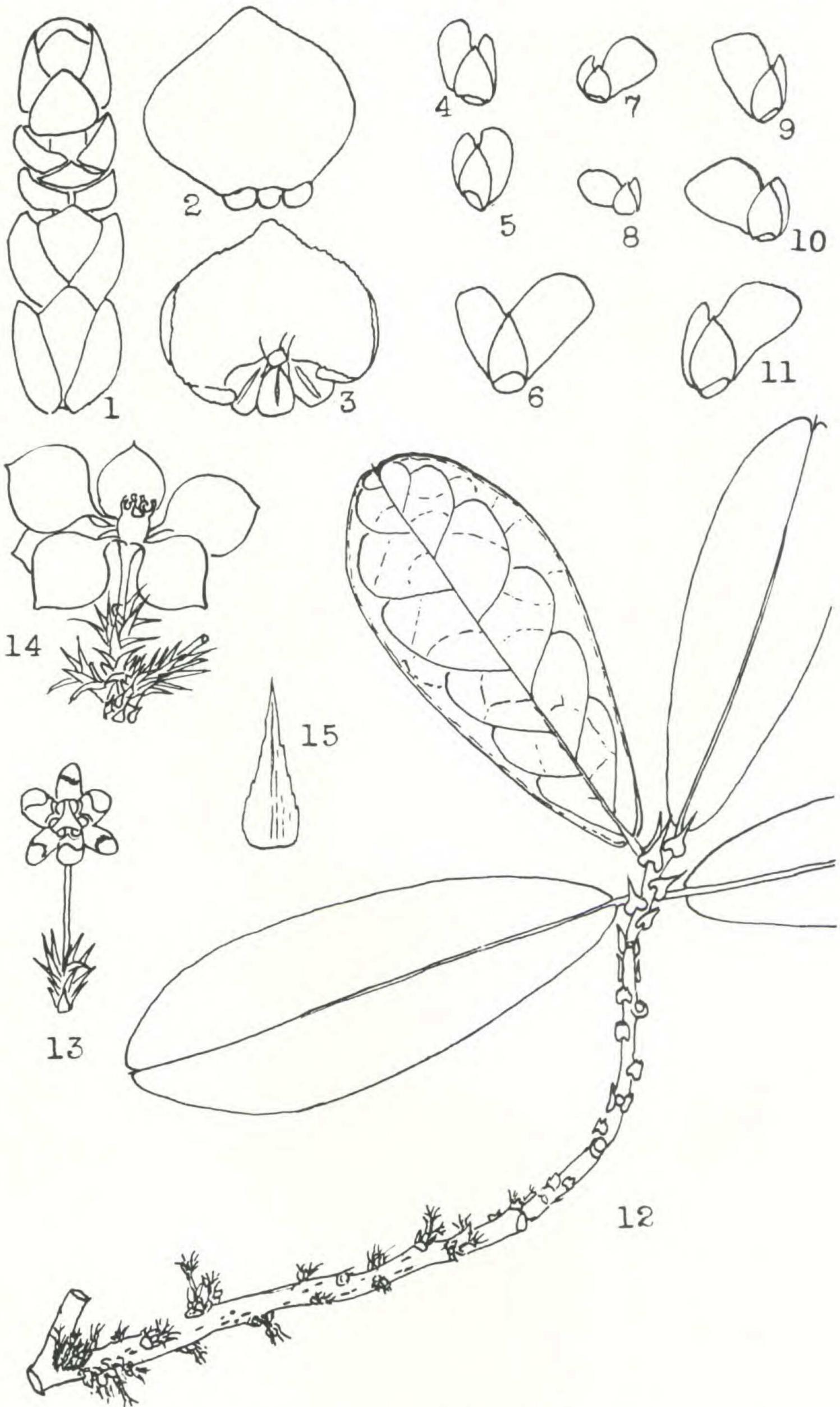
The size of the leaves and the indumentum of the plant of this species resemble those of *M. hainanensis* Merr. & How, but the latter species can be readily distinguished by its distinct deltoid calyx lobes which are persistent on the capitulum, and its longer peduncles which are 10–13 mm. long.

EXPLANATION OF PLATE

FIGURES 1-3, the male flower of *Fokienia*: FIG. 1. A cone terminal to a branchlet, with two whorls of leaves shown ($\times 10$). FIG. 2. A cone scale, dorsal view ($\times 25$). FIG. 3. The same, ventral view ($\times 25$). FIGURES 4-11, various forms of seed of *Fokienia* ($\times 2$): FIG. 4. From *Ching 2361* (Chekiang). FIG. 5. From a young cone of *Keng 350* (Chekiang). FIG. 6. From an older cone of the same specimen. FIG. 7. From B. Hayata in 1917 (Tonkin). FIG. 8. From *Poilanc 6527* (Tonkin). FIGS. 9 & 10. Two seeds from different scales of one cone from *Tsiang 8867* (Kweichow). FIG. 11. From Gressitt (E. Kwangtung). FIGURES 12-15, *Sauropus changiana*: FIG. 12. Habit sketch ($\times 1$). FIG. 13. A male flower with the perianth segments mechanically spread ($\times 5$). FIG. 14. A fascicle with one female flower shown ($\times 5$). FIG. 15. A bract ($\times 12$).

ARNOLD ARBORETUM,

HARVARD UNIVERSITY.



STUDIES IN THE THEACEAE, XXIV
THE GENUS SLADENIA

CLARENCE E. KOBUSKI

With one plate

The genus *Sladenia* was first described by Kurz in Jour. Bot. 11: 194, t. 133, f. 1. 1873 from Yunnan, China, and was named after Major E. B. Sladen, "the energetic head of the Yunan expedition." This expedition was from Burma to southwestern China by way of the Irrawaddy and Bhamo. Kurz, in working up the plants from this expedition, recognized the genus as new and belonging to the Theaceae. In describing it he suggested a relationship close to *Cleyera* or *Ternstroemia*. The description of the genus was based on flowering material, and until now the mature fruit has not been described. Kurz proved to be very astute in his recognition of the rightful position of the genus! However, since 1873 the genus has been transferred to three other families, namely, the Dilleniaceae, Linaceae, and Actinidiaceae.*

A short resumé of the history of the genus follows. At first, it appears, no botanist seemed willing to admit *Sladenia* to the Theaceae. This, I presume, was because of the dichasial cyme, an inflorescence quite alien to the family, and the unusual, low-numbered stamens. Dyer in Fl. Brit. India, the year (1874) after its description, records the genus. This volume evidently was prepared simultaneously with Kurz's original description, since it refers only to the manuscript of Kurz.

Gilg (Nat. Pflanzenfam. III. 6: 128. 1893) removed *Sladenia* from the Theaceae and placed it questionably in the Dilleniaceae in company with *Actinidia*, *Clematoclethra*, and *Saurauja*, and in 1925, in the second edition of the same work, Gilg and Wedermann continue the relationship of these four genera in their newly created family Actinidiaceae. There they already state that *Sladenia* varies in anatomy from the other three members. Gilg's persistence in associating *Sladenia* with *Actinidia*, *Clematoclethra*, and *Saurauja* has had considerable influence on most botanists, since *Sladenia* is usually filed in most herbaria with either Dilleniaceae or Actinidiaceae, if the latter family is recognized as such.

It might be mentioned here that Hallier in his study of the Linaceae (Beih. Bot. Centralbl. 39(2): 137. 1923) placed *Sladenia* in this family. However, this move was never recognized and has received no support.

It is strange that a genus so distinct and yet so often misplaced in herbaria has not been redescribed under other names. Yet, as far as is

*Dr. Hui Lin Li, in his work on the Actinidiaceae, recently wrote me that, in his opinion, *Sladenia* did not belong in the Actinidiaceae, and suggested its return to the Theaceae.

known, no synonyms have appeared in literature. The genus has been often collected. In the herbarium of the Arnold Arboretum alone are found fourteen specimens from Yunnan and three from Burma.

Evidence of its true position was accumulated by the late Prof. Rehder, in seeking to identify a specimen collected in Yunnan. Up until that time (1936) *Sladenia* was placed in our herbarium under Dilleniaceae. Rehder thought that he had before him a new genus and planned to describe it as such. He sent material to Dr. Roger P. Wodehouse for comments on the pollen and to Prof. I. W. Bailey and the late Prof. S. Record for anatomical information. The separate responses of these three authorities are very interesting and are worthy of quotation in part.

Dr. Wodehouse responded as follows: "The pollen of your Asiatic shrub (Henry 11884) confirms its association with the Theaceae. Compare, for example with the figure of *Ternstroemia granulata* (Pl. 21, fig. 22. Bull. Torrey Club 59. 1932). In case you wish to include the pollen grain in your description, I offer you the following (description) and the enclosed figure." The technical description follows in the discussion of the species and the figure is included on the plate.

Prof. Record responded to Prof. Rehder's inquiry as follows: ". . . and of the four families you mention (Celastraceae, Theaceae, Tiliaceae and Flacourtiaceae) it seems to me that the only one possible is Theaceae. As for the genus I suggest *Eurya*." No record of any correspondence with Prof. I. W. Bailey can be found, and his response to Prof. Rehder must have been verbal. However, Prof. Rehder, in his reply to Record, stated that wood had been given also to Bailey for examination and that Bailey had agreed with Record's conclusion.

Metcalfe & Chalk, in their recent work on the anatomy of the dicotyledons, placed *Sladenia* among the "Anomalous genera" of the Theaceae.

It is interesting to note here that Wodehouse, through the study of the pollen, placed the genus close to *Ternstroemia*, while Record, through anatomical study, suggested its relationship with *Eurya*. It is interesting to further note that Kurz in his original description stated that "This new genus apparently comes near *Cleyera* or *Ternstroemia*." In the herbarium of the Arnold Arboretum, the genus is listed 10 A, immediately following *Ternstroemia* and preceding *Adinandra*, *Eurya*, and *Cleyera*.

Because of the dichasial cyme, the low number of stamens (ca. 10) with pilose anthers and enlarged filaments, it may be advisable to separate the genus from its closest relatives by the designation of a new subtribe, **Sladeniinae**.

This would place the genus in the tribe Ternstroemieae between the two subtribes Ternstroemiinae and Adinandrinae. In the Adinandrinae are found *Adinandra* and *Cleyera*, both with pilose anthers and *Visnea* with a reduced number of stamens.

Gilg and Werdermann designated a subfamily Sladenioideae and a tribe Sladenieae for the single genus in the family Actinidiaceae. However, at the same time they designated a subfamily and tribe for each of the four